

REMARKS/ARGUMENTS

Re-examination and favorable reconsideration in light of the above amendments and the following comments are respectfully requested.

Claims 1 - 19 are pending in the application. Currently, all claims have been rejected.

By the present amendment, claims 1, 2, and 6 have been amended and claim 3 has been cancelled. The amendment to claim 6 is to correct a grammatical error and is not made for purposes of patentability.

In the office action mailed June 15, 2005, claims 1 - 3, 6, 7, 9 - 11, 13, 16, and 17 were rejected under 35 U.S.C. 102(b) as being anticipated by U.S.P. 6,416,283 to Johnson et al.; claim 4 was rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson et al.; claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson et al. in view of U.S.P. 5,232,343 to Butts; claim 8 was rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson et al. in view of U.S.P. 6,672,836 to Merry; and claims 12, 15, and 19 were rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson et al. in view of U.S.P. 6,234,752 to Wei et al.

The foregoing rejections are traversed by the instant response.

The present invention relates to a turbine blade comprising an airfoil having a root end and a tip end and at least one cooling passageway in the airfoil. The at least one cooling passageway extends from the root end to the tip end and has a circular cross-section. The turbine blade further comprises a plurality of turbulation promotion devices in the at least one cooling passageway. The plurality of turbulation promotion devices comprises a plurality of pairs of aligned turbulation

promotion devices. Each of the plurality of turbulation promotion devices in each pair is arcuate in shape and circumscribes an arc less than 180 degrees.

In order for a reference to anticipate a claim, each and every limitation in the claim must be found either expressly or inherently in a single prior art reference. Claim 1 is allowable because the Johnson et al. patent relied upon by the Examiner does not disclose each and every limitation of claim 1. In particular, there is no disclosure in Johnson et al. of a plurality of pairs of aligned turbulation promotion devices with each pair including two arcuately shaped turbulation promotion devices which circumscribe an arc less than 180 degrees. Using the electrode disclosed in Johnson et al., one would form pairs of aligned turbulation promotion devices with one of the turbulation promotion devices being less than 180 degrees and the other of the turbulation promotion devices being greater than 180 degrees.

Claims 2, 6, 7, 9 - 11, 13, 16, and 17 are allowable for the same reasons as claim 1 as well as on their own accord. For example, claim 10 is not anticipated by Johnson et al. because it does not disclose spaced apart end portions of a first pair of turbulators being axially aligned with spaced apart end portions of adjacent pairs of turbulators. Claim 11 is allowable because the turbulators in Johnson et al. are trip strips, not notches cut into a wall of the cooling passageway.

The rejection of claim 4 on obviousness ground is duly noted; however, it should be withdrawn. The Examiner has not made out a *prima facie* case of obviousness since he has not presented any prior art or any technical reasoning as to what would motivate one of ordinary skill in the art to have end portions spaced apart by a gap in the range of 1e to 4e. The

patent law does not require Applicant to present evidence of any advantage to the claimed construction; however, it does require the Examiner to make a *prima facie* case of obviousness first.

The rejection of claim 5 over the combination of Johnson et al. in view of Butts is duly noted; however, it should be withdrawn because one of ordinary skill in the art would not be motivated to combine the two references. Johnson et al. is directed to providing aligned pairs of turbulation promotion devices in the cooling passageway, while Butts teaches or suggests offset turbulation promotion devices (see FIG. 3). In other words, Butts teaches away from the claimed invention. Hence, one of ordinary skill in the art would not be motivated to combine the references in the manner suggested by the Examiner. Claim 5 is further allowable because Butts does not cure the aforementioned deficiencies of Johnson et al.

The rejection of claim 8 over the combination of Johnson et al. and Merry should be withdrawn because the Examiner misinterprets the disclosure of the Merry patent. Merry does not disclose a P/e ratio of 5 to 20. A close review of Merry shows that it discloses an e/P ratio of 5 to 20, which is the inverse of the claimed subject matter. see the table in column 8 of the Merry patent. Claim 8 is further allowable because Merry does not cure the deficiencies of the Johnson et al. patent.

The rejection of claims 12, 15 and 19 over Johnson et al. and Wei et al. should be withdrawn since Wei et al. does not cure the aforementioned deficiencies of Johnson et al.

Applicant notes that there is no prior art rejection of claims 14 and 18 set forth in the office action. It is assumed that these claims are allowable because none of the cited and applied references teaches or suggests the claimed angles and

because the Examiner has not cited anything which would teach one of ordinary skill in the art to use the claimed angles.


For the foregoing reasons, the instant application is believed to be in condition for allowance. Such allowance is respectfully solicited.

Should the Examiner believe an additional amendment is needed to place the case in condition for allowance, he is hereby invited to contact Applicants' attorney at the telephone number listed below.

No fee is believed to be due as a result of this response. Should the Director determine that a fee is due, he is hereby authorized to charge said fee to Deposit Account No. 21-0279.

Respectfully submitted,

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I, Nicole Motzer, hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: "Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313" on September 15, 2005.

